

PVT Measurements for Toluene in the Near-Critical and Supercritical Regions

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New *PVT* measurements for toluene in the near-critical and supercritical regions will be presented. Measurements were made using a constant-volume piezometer. The sample was confined to a 36.8 cm³ cylindrical cell of a corrosion-resistant steel alloy, provided with a steel ball for stirring. The cell was separated from the rest of the filling and pressure measurement systems by a very sensitive diaphragm-type null indicator. The temperature was measured with a 10 Ω platinum resistance thermometer with an uncertainty of 10 mK. Pressure was measured by means of a dead-weight gauge with an uncertainty of 0.015 to 0.02 MPa. The volume of the cell was corrected for both temperature and pressure expansions. Uncertainties of the density measurements are estimated to be 0.05 to 0.20%, depending on the experimental pressure and temperature. The volume of the piezometer V_{PT} was calibrated using a reference fluid (water) with well-known *PVT* properties at various temperatures and pressures. Measurements have been made along various near-critical and supercritical isotherms between T_C and 623 K at pressures up to 30 MPa.

The derived *PVT* data for toluene are compared with values predicted from a preliminary fundamental equation of state by Lemmon and previous measurements of other authors.